XXXVI.—*On some new Genera and Species of Fishes collected by* Drs. Keferstein *and* Hæckel *at Messina.* By Prof. Kaup.

[With a Plate.]

Family Leptocephalidæ.

Genus Stomiasunculus, n. g.

Diagnosis. No ventral fins; distinct dorsal, caudal, and anal fins only towards the extremity of the body. Head large, with a lobe at the apex of the lower jaw. Operculum produced posteriorly, with a large aperture directed far forwards. No teeth.

Description. This is a very elongated form, round rather than compressed, with a smooth body, of which the muscular chevrons are very simple. Anus situated towards the extremity of the body, in a sacciform process.

In this genus there is a certain resemblance to *Stomias* (such as occurs in *Esunculus* to *Esox*), especially in the position of the dorsal and anal fins. I even suppose that the injured caudal fin was forked, as in *Esunculus*. As there are still many gaps in this family, it is impossible to say exactly what is the true position of this genus.

Stomiasunculus barbatus, Kaup. Pl. III. fig. C.

Head large, obtuse, with black eyes, not silvery as in the *Leptocephali*. The operculum and cheeks exhibit rows of fine points; along the intestinal canal and the anal fin there is a row of points, such as occurs in many *Leptocephali*. The rays of the dorsal and anal fins are finely punctate; and there are also fine points on the lower part of the caudal. Found at Messina by Dr. Keferstein. The figure is three times the natural size.

Genus Leptocephalus, Gron.

To this genus, which is far too little known, I add two new species, found at Messina and received from Drs. Keferstein and Hæckel.

Leptocephalus Hæckeli, Kaup, n. sp. Pl. III. fig. B.

Head small and pointed, with distinct teeth; no rows of points on the middle of the lateral line; rows of points along the yellowish intestinal canal; tail one-eighth of the length of the body. Resembles *L. brevirostris,* Kaup; but the snout is longer, the body not so high, and the tail less pointed.

Leptocephalus Kefersteini, Kaup, n. sp. Pl. III. fig. A.

Head extremely small, with very fine teeth. Seven roundish spots, composed of points, along the intestine. Anus rather be-

hind the middle of the body. The margin of the indistinct anal fin shows rows of points. The lower parts of many of the chevrons blackish in the furrows; punctured with black towards the caudal extremity. Both the dorsal and ventral margins are notched in an undulating manner; the latter is of an orange-colour.

Leptocephalus Morrisi, Penn.

Following Yarrell's example, I unite *L. Spallanzani*, Risso, with *L. Morrisi*. In the 'Ichthyologie de Nice,' Risso described a fish under the latter name, which, as C. Bonaparte remarks, does not belong to it; but where it is to be placed, Bonaparte could not determine any more than myself. The *Lepidopus pellucidus*, Risso, from the description of which the name *Kamarina* and whole passages of the text have been transferred into the description of *Leptocephalus Spallanzani*, likewise remains a doubtful species, although Risso cites it under his *L. Spallanzani*. Bad as is the figure of *L. pellucidus* in the 'Ichthyologie de Nice,' it cannot be believed that it was drawn from a true *Spallanzani* or *Morrisi*. It is also very probable that Rafinesque has described this fish, which is common at Messina, in his 'Caratteri;' but there is no loss to science in leaving his very bad descriptions undisturbed in this genus. According to the reports of Hæckel and Keferstein, this species, like all the rest, lives in the open sea, and not in the sea-weed. They are caught in bottles by boys whilst bathing.

The diagnosis of this species, which is difficult to characterize, might be as follows:—Head large, with an obtuse, projecting snout; black points at the apices of the muscular chevrons, and along the intestine; fine points at the root of the anal and the end of the dorsal fins; caudal fin pointed.

It is impossible to say more than this, for there are no other characters on which we can rely. There are individuals with teeth, with traces of teeth, and without teeth; others in which the body, and others, again, in which the tail is longest. In confirmation of this, I give the measurements of twelve individuals:—

1.	Trunk 48,	Tail 65 mill.		7.	Trunk 55,	Tail 50 mill.	
2.	„ 50,	„ 60	„	8.	„ 63,	„ 60	„
3.	„ 50,	„ 70	„	9.	„ 63,	„ 54	„
4.	„ 51,	„ 62	„	10.	„ 66,	„ 61	„
5.	„ 53,	„ 69	„	11.	„ 68,	„ 59	„
6.	„ 55,	„ 66	„	12.	„ 86,	„ 48	„

Even the series of points along the vertebral column is not reliable; it very often disappears beyond the anus, but is still always distinctly visible towards the end of the tail.

Leptocephalus diaphanus, Kaup, Apod. Fish. pl. 17. fig. 9.

This species, of which I have received the greatest number from M. Keferstein, is much more constant in the proportions of its body. The bulbus (Kaup, pl. 17. fig. 9 *a*) frequently appears blackish through the skin, from the presence of food. Four specimens gave the following dimensions:—

1.	To the bulbus or stomach	23,	to the anus	54,	to the caudal	57	mill.
2.	„	„	23,	„	52,	„	53	„
3.	„	„	30,	„	67,	„	66	„
4.	„	„	28,	„	58,	„	61	„

Out of a great number of individuals I only met with two which showed the course of the intestine.

Leptocephalus brevirostris, Kaup, Apod. Fish. fig. 15.

A specimen from Messina exhibits all the characters of that figured by me, except that it has a rather more pointed head and a somewhat longer tail.

Body 48, tail 21 mill. in length

Tilurus trichiurus, Kaup.

Unfortunately my figure, given at pl. 16. fig. 5 of the 'Apodal Fishes,' is drawn from a specimen in which the tail was defective. The hair-like point, which measures 18 mill. in length from the anus, is usually lost when several individuals are sent in the same bottle. In this case the tails are so twisted together that, in separating them, a portion of the filament with the apex is lost, especially from the point at which it becomes blackish. If the black apex of the tail be quite perfect, it forms at the extremity a coil, which is drawn up in the form of a screw, in a gelatinous mass. With the highest magnifying power, I was unable to ascertain the true nature of the apex of the tail (which is as large as a pin's head) and of its envelope. Is the capillary portion with the coil a prehensile tail? Is the gelatinous mass animal mucus, or does it consist of animals which the caudal extremity seizes and surrounds voluntarily or accidentally? These questions can be cleared up only on the spot and by the examination of many individuals.

Genus Porobronchus, Kaup, n. g. Pl. III. fig. D.

Dr. Hæckel has furnished the Berlin Museum and myself with specimens of an excessively small and nearly linear fish, which was taken near Messina. It is so remarkably novel a form, and possesses such abnormal characters, that I should be surprised if it had escaped the Italian ichthyologists. Its characters are as follows:—

Diagnosis. Head and guttural sac large. Eyes rather large,

placed towards the extreme angle of the mouth. Teeth wanting. Pectoral fins wanting. Body linear, with a filiform caudal extremity. Dorsal and anal fins of equal length; the former commences above the end of the guttural sac, and exhibits one more strongly developed and elongated ray; the anal runs up to the aperture of the guttural sac. The anus must also open into this aperture. Body naked, with no trace of scales.

I do not know where to place this form, to which I give the name of *Porobronchus linearis* (Pl. III. D). Its place is perhaps in the vicinity of *Saccopharynx*, Mitch., which certainly does not belong to the Apodes, and, like the above genus, forms the commencement of some new family, or of one which is not yet well established.

The specimens described are in the Collection of the British Museum.

XXXVII.—*Mycological Investigation upon Fermentation.* By M. Hermann Hoffmann*.

Although the phenomenon of fermentation long since attracted the attention of observers, its origin was still involved in considerable obscurity, and various hypotheses, amongst others that of spontaneous generation, had been invented to explain it. In order to solve this problem definitively, M. Hoffmann undertook a series of experiments, of which he gives an account in the 'Botanische Zeitung' of Berlin for 1860, Nos. 5 & 6.

1. If the juice extracted from some vegetables be examined by the microscope, it is found to contain here and there, not only cells similar to yeast, but also spores of *Mucedinæ* (such as *Cladosporium*, *Stemphylium*, &c.), some of which have even begun to germinate. These would be sought in vain in the interior of the fruits furnishing the juice under examination; so that it is extremely probable that they are derived from their surface.

Boiling water kills the germs of yeast-cells. Hence, if gooseberries, before being crushed, be immersed for four to ten seconds in boiling water, it is only after the lapse of four days that a fermentation with evolution of gas makes its appearance in the expressed juice, and then but feebly. If gooseberries be placed for three-quarters of an hour in cold water, and agitated from time to time, the water, when decanted, will be found to contain a small quantity of ferment, which may be employed as yeast, and which will evolve carbonic acid with a solution of sugar. When the surface of a gooseberry is scraped with a blunt knife,

* Translated from the 'Bibliothèque Universelle,' 1860, p. 337, by W. S. Dallas, F.L.S.